Shively Labs®

Model 6810 Circularly Polarized FM Antenna — Full-Wave-Spaced

True circular polarization

Power rating: 10 kW per Bay

Best sidemount in the industry for directionals

Will diplex over 2.2 MHz bandwidth

Shively standard features:

- Ring stub design
- Consistently predictable patterns
- Digital-ready
- Pattern studies available
- No factory personnel needed to install
- Adjustable fine-matching transformer
- Radomes and deicers available
- Rugged corrosion-resistant mounts
- Works with regular towers; no need for special frequency-sensitive tower sections
- Pressure relief valve for easy purging of the system
- Special spacing, H/V ratios, null fill and beam tilt available

Electrical specifications:

No. of Bays	Gain		Power Rating	No. of Bays	Gain		Power Rating
	Power	dB	kW		Power	dB	kW
1	0.45	-3.43	10	7	3.93	5.94	40
2	0.99	-0.04	20	8	4.53	6.56	40
3	1.56	1.92	30	10	5.74	7.59	40
4	2.14	3.30	40	12	6.97	8.43	40
5	2.73	4.36	40	14	8.18	9.13	40
6	3.33	5.22	40	16	9.42	9.74	40

Performance specifications:

Polarization: Right circular

VSWR:

Single bay: 1.06 : 1 ± 100 kHz
1.1 : 1 ± 200 kHz

0.8 to 1.8 MHz spacing, each channel:
1.10 : 1 ± 100 kHz
1.20 : 1 ± 200 kHz

Greater than 1.8 MHz spacing: Contact the factory.

Azimuth Pattern Circularity: Horizontal component ±1.5 dB on pole.

Input Connection: Female 3-1/8 in EIA

Notes:

1. Our gain figures are derived from the computed directivity and include the losses in the antenna feed system.

   Gain is provided for one polarization and is equal in circularly polarized antennas for both horizontal and vertical components. Gain will be reduced if null fill, beam tilt, special H/V ratio, or special wavelength spacing is provided. Gain will increase in a directional array by the directivity of the azimuth pattern.

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Certified to ISO-9001

Model 6810 size and weight:

No. of Bays	Vertical Tower Space						Weight					
	Antenna Radiation Aperture		Pipe Length Required		Total Tower Space Recommended		Without radomes		With radomes		With radomes & 1/2" (1.2 cm) radial ice	
	ft	m	ft	m	ft	m	lb	N	lb	N	lb	N
1	2	0.6	9	2.7	20	6.1	130	578	162	720	256	1138
2	10	3.0	19	5.8	30	9.1	200	889	264	1174	443	1970
3	20	6.1	29	8.8	40	12.2	270	1200	366	1627	630	2801
4	30	9.1	39	11.9	50	15.2	340	1512	468	2081	817	3632
5	40	12.2	49	14.9	60	18.3	410	1823	570	2534	1004	4464
6	50	15.2	59	18.0	70	21.3	480	2134	672	2988	1191	5295
7	60	18.3	69	21.0	80	24.4	550	2445	774	3441	1379	6131
8	70	21.3	73	22.2	90	27.4	636	2828	892	3966	1582	7033
10	90	27.4	93	28.3	110	33.5	776	3450	1096	4873	1956	8696
12	110	33.5	113	34.4	130	39.6	916	4072	1300	5780	2330	10359
14	130	39.6	133	40.5	150	45.7	1056	4695	1504	6687	2704	12022
16	150	45.7	153	46.6	170	51.8	1789	7954	1708	7594	3078	13684

Windload, TIA-222 Rev. G:

No. of Bays	Without radomes				With radomes				With radomes & 1/2" (1.2 cm) radial ice			
	EPA_N		EPA_T		EPA_N		EPA_T		EPA_N		EPA_T	
	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2
1	5.2	0.5	5	0.5	7.2	0.7	6.6	0.6	8.3	0.8	7.5	0.7
2	9.5	0.9	9.7	0.9	13.5	1.3	13	1.2	16.5	1.5	13.0	1.2
3	13.9	1.3	14.5	1.3	19.9	1.8	19.3	1.8	24.6	2.3	23.6	2.2
4	18.2	1.7	19.2	1.8	26.2	2.4	25.7	2.4	32.8	3.0	31.7	2.9
5	22.6	2.1	23.9	2.2	32.6	3.0	32	3.0	41.0	3.8	39.7	3.7
6	26.9	2.5	28.6	2.7	38.9	3.6	38.4	3.6	49.2	4.6	47.8	4.4
7	31.3	2.9	33.4	3.1	45.3	4.2	44.7	4.2	57.4	5.3	55.9	5.2
8	35.6	3.3	38.1	3.5	51.6	4.8	51.1	4.7	65.6	6.1	63.9	5.9
10	44.3	4.1	47.5	4.4	64.3	6.0	63.8	5.9	81.9	7.6	80.1	7.4
12	53	4.9	57	5.3	77.0	7.2	76.5	7.1	98.3	9.1	96.2	8.9
14	61.7	5.7	66.4	6.2	89.7	8.3	89.2	8.3	114.7	10.7	112.3	10.4
16	70.4	6.5	75.9	7.1	102.4	9.5	101.9	9.5	131	12.2	128.4	11.9

Notes:

2. The mounting structure must not flex more than ± 1/2 in (± 1.2 cm) in any 10-ft (3-meter) section. 5 feet (1.5 m) of mounting structure is required above and below the antenna bays for proper pattern formation.
3. Antenna radiation aperture is the distance from the center of the top bay to the center of the bottom bay. Physical space used is from the top of the top bay to the input flange at the bottom of the array, or the bottom of the bottom bay in a center-fed array. Total tower space recommended allows ten feet (3 m) of clear tower space above and below the antenna to protect from pattern interference by other antennas. At frequencies lower than 98 MHz, each of these dimensions will increase by up to 1 ft (0.3 m) per bay.
4. Seven bays or less are normally end-fed. All antennas supplied with beam tilt will be center-fed. Antennas with an odd number of bays are normally not available with center feed.
5. Windload and weight tabulations are estimates and assume 98 MHz. They include the bay, interbay feedline, input connection, and a fine-matching transformer. No values have been included in these tabulations for mounts. Actual values vary with the specific installation. Contact us with details of your installation if more precise values are needed.
6. Antenna areas and weights calculated in accordance with TIA-222-G.
   EPA_N - Effective projected area associated with the windward face normal to the azimuth of the antenna: $EPA_N = \sum(C_a A_A)_N$
   EPA_T - Effective projected area associated with the windward face at the side of the antenna: $EPA_T = \sum(C_a A_A)_T$
   Assumptions: Structure Class II; Exposure Category C; Topographic Category 1; Maximum basic windspeed 112 mph; with 1/2 inch design ice, 50 mph; Height about ground 200 ft.
7. Deicers add approximately 1 lb (4.4 N) per bay in weight and a windload of EPA_N = 0.7 ft^2 and EPA_T = 0.7 ft^2 per bay.
8. Ask for technical assistance at Shively if you are planning to mount antennas on AM towers or install them at altitudes over 3,000 ft (915 m) above mean sea level.